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AN APPRAISAL OF THE BOMBING OF NORTH VIETNAM^(U)

(THROUGH 19 JUNE 1967)

JUNE 1967

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Prepared Jointly by
**The Central Intelligence Agency
and
The Defense Intelligence Agency**



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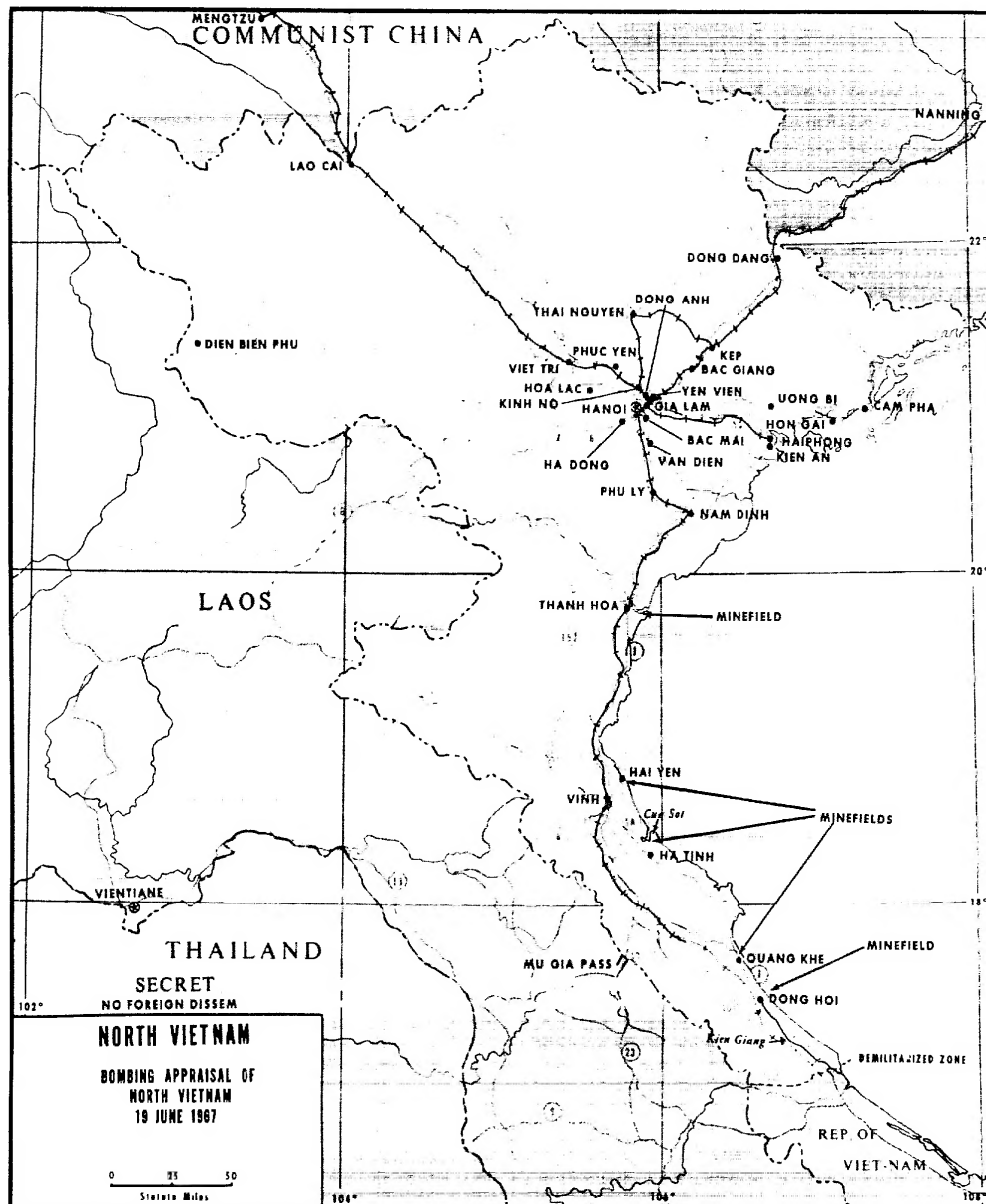


AN APPRAISAL OF THE BOMBING OF NORTH VIETNAM (THROUGH 19 JUNE 1967)

FOREWORD

This report is prepared on a monthly basis at the request of the Secretary of Defense for an evaluation of certain effects of the ROLLING THUNDER program. The report covers three general areas of concern: Effects on Military Targets; Leadership and Public Reactions; and Effects on the NVN Economy. The discussion of political effects is limited to those developments within North Vietnam which relate to Hanoi's attitude toward continuing the war and the effects the ROLLING THUNDER attack has on civilian morale in North Vietnam.

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AN APPRAISAL OF THE BOMBING OF NORTH VIETNAM
THROUGH 19 JUNE 1967

SUMMARY

1. (S/NFD) Air activity over North Vietnam continued at the high level of the previous period. The preponderance of strikes continued to be against lines of communication (LOC's) and those against rail targets reached a new monthly high. Damage inflicted on transport equipment was significantly greater than in any previous month this year. Attacks were also made on jet supporting airfields, military barracks, electric power facilities, the Thai Nguyen Iron and Steel Combine, and POL storage sites.
2. (S/NFD) The locomotives and rolling stock reported destroyed and damaged during May reached the highest monthly total this year. Although the over-all capability of the rail system has deteriorated somewhat, due to the increased number of strikes against significant rail targets in the northern and central parts of the country and heavier attrition of rolling stock, the massive North Vietnamese construction and repair efforts continue to offset much of the effects of air strikes on the LOC's.
3. (S/NFD) The Hanoi-Dong Dang line sustained damage that probably disrupted through rail service for much of the period. The Hanoi-Lao Cai line was closed for through rail

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service north of Viet Tri for about two days. The Hanoi-Haiphong line was not struck and was considered operational for through traffic during the entire month. The Hanoi-Vinh line remains heavily interdicted and through traffic is possible only as far south as Phu Ly. Shuttle operations are possible south of Phu Ly between major points of interdiction.

4. (S/NFD) The high level of strikes against the highway system continued, with the bulk of the effort in the Panhandle area. Attacks on vehicle traffic increased significantly, and pilots reported more trucks destroyed or damaged during May than in any previous month except August 1966. Vehicle sightings were heaviest on roads serving the DMZ and the Lao Panhandle; however, convoys of up to 50 trucks were noted moving along principal routes toward Hanoi from the north. Strikes on several important motor vehicle repair shops probably seriously disrupted centralized motor transport repair and may force the North Vietnamese to rely more on dispersed facilities.

5. (S/NFD) The road network continues adequate to meet essential transportation requirements. However, the difficulty and cost of moving a given amount

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of supplies has been greatly increased. The problems of maintaining road trafficability will increase with the gradual onset of the southwest monsoon season (May-September), and sufficient rain will have fallen by July to reduce road capacities to their annual low.

6. (S/NFD) Waterborne transportation continued at a high level. The majority of air strikes against waterborne traffic were on inland routes below the 20th Parallel. Reported losses of watercraft in May were higher than for any month since the start of the Rolling Thunder program. Strikes against coastal transshipment points and naval bases decreased from the previous period. No strikes were conducted against maritime port facilities during May; however, attacks on supporting installations have affected port operations.

7. (S/NFD) Attacks against airfields continued and prevented flight operations at Kep, Hoa Lac and Kien An for short periods of time following the strikes. By the end of the reporting period the North Vietnamese air force reactions appeared to diminish and air engagements decreased, possibly as a result of aircraft losses and airfield interdictions.

8. (S/NF) Firings of surface-to-air missiles (SAM's) remained high -- 481 were fired from 15 May to 11 June -- but

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the total declined from the record of the previous reporting period. There were five confirmed and four probable US aircraft lost to missiles. Although missile activity in the area of the DMZ has not been noted since early June, the North Vietnamese can be expected to make efforts to improve SAM defenses in the Panhandle and DMZ area.

9. (S/NFD) The cumulative effects of the air strikes in North Vietnam have caused multiple management and logistic problems and have degraded North Vietnam's capability for sustained large-scale conventional military operations against South Vietnam. Hanoi must devote an increasing amount of manpower, material, transportation, and time to accomplish the movement of supplies to the South. However, the North Vietnamese still retain the capability to support activities in South Vietnam and Laos at present or increased combat levels and force structures.

10. (S/NFD) During the past month, residents of North Vietnam's two major cities have experienced further war related dislocations and inconveniences. [REDACTED]

25X1C

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[REDACTED] the capital city is now more than 50 per cent evacuated and Haiphong, more than 75 per cent. Food is adequate, but there are shortages of certain items. [REDACTED]

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[REDACTED] the increased hardships have not affected popular support for the war effort.

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The mood of the people is said to continue to be one of resignation under conditions of considerable difficulty.

11. (S/NFD) The concentrated attacks on North Vietnam's electric power industry are having widespread effects on modern industry. Both the Thai Nguyen Iron and Steel Combine and the Haiphong Cement Plant are inoperative because of bomb damage and loss of power. In addition, it is estimated that the operation of North Vietnam's other modern industrial plants -- chemical, fertilizer, paper, and textile -- is being seriously hampered by the power shortage. The total amount of generating capacity out of operation reached a peak in May of 165,000 kilowatts (kw), or 87 per cent of national capacity. The rapid restoration of capacity -- partially offset by restrikes -- reduced this figure to a tentative estimate of 150,000 kw out of operation by mid-June, or some 80 per cent of the national total.

12. (S/NFD) The Thai Nguyen Iron and Steel Combine, one of the most significant of North Vietnam's industrial facilities, was restruck during the reporting period. Only one of the three blast furnaces remains undamaged, and it is highly unlikely that pig iron is being produced. The status of barge, POL tank, and pontoon fabrication at Thai Nguyen is unknown. Some fabrication could continue in undamaged portions of the complex.

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13. (S/NFD) Identified seaborne imports reached a record high total of 147,400 metric tons during May, nearly twice the average monthly volume observed in 1966. Imports of foodstuffs (69,400 metric tons) and petroleum (35,700 metric tons) reached record volumes. Although the port of Haiphong has substantially increased its offloading performance, the higher level of seaborne imports has resulted in a backlog of freighters that appears to be the worst yet experienced. Foreign exchange earnings from seaborne exports of coal, apatite, cement, and pig iron were the lowest on record.

14. (S/NFD) The consumption of petroleum in North Vietnam during May is estimated to have increased to at least 18,500 metric tons, because of increased transportation demands and the greater use of diesel powered generating units. Stocks on hand as of 31 May are estimated to have amounted to at least 64,000 metric tons, equivalent to about 100 days of supply.

15. (S/NFD) Cumulative measurable damage attributable to the Rolling Thunder program through May is estimated to be \$266 million.* In addition to the measurable losses, there

* See footnote page 22.

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continue to be many other losses to the economy and to the military establishment which cannot be assigned meaningful values.

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Effects on Military Targets

1. (S/NFD) Air activity over North Vietnam continued at the high level of the previous period as the southwest monsoon brought improved flying conditions. Nearly 3,000 sorties, the highest weekly total for the year, were flown during the third week of May. The preponderance of the strikes continued to be against lines of communication (LOC's) and those against rail targets reached a new monthly high. Damage inflicted on transport equipment was significantly greater than in any previous month this year. Air attacks against the transportation network continued to disrupt normal operations as well as to force the North Vietnamese to improvise countermeasures and to expend substantial amounts of labor and materials in order to keep traffic moving. Attacks were also made on jet-supporting airfields, military barracks, electric power facilities, the Thai Nguyen Iron and Steel Combine, and POL storage sites.
2. (S/NFD) Strikes against the rail system reached a record high for a monthly period. Activity north of Hanoi was concentrated on yards and sidings, while bridges were the principal targets south of Hanoi. The locomotives and rolling stock reported destroyed and damaged during May reached the highest monthly total this year. The over-all capability of

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the rail system has deteriorated somewhat due to the increased number of strikes against significant rail targets in the northern and central parts of the country and heavier attrition of rolling stock. The massive North Vietnamese construction and repair efforts continue, however, to offset much of the effect of air strikes on the LOC's.

3. (S/NFD) The Hanoi-Dong Dang line, the main rail connection with China, sustained damage that probably disrupted through rail service for much of the period. Strikes were mainly against bridges, railroad yards, sidings and large concentrations of rolling stock. The Bac Giang Rail and Highway Bridge was struck twice in May, and the western span was reported destroyed. However, a bypass bridge and a rail-to-water transshipment facility are available.

4. (S/NFD) The Hanoi-Lao Cai line was closed for through rail service north of Viet Tri for about two days. The destruction of the Viet Tri Rail and Highway Bridge continued to necessitate shuttling over the Riviere Claire throughout the period. Strikes against the railroad car ferry and pontoon bridge near the destroyed bridge probably further disrupted service. The Hanoi-Haiphong line was not struck and was considered operational for through traffic during the entire month. The Hanoi-Vinh line remains

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heavily interdicted and through traffic is only possible as far south as Phu Ly. However, attacks against this line declined compared to previous months as more strikes were conducted against rail targets in the north. Shuttle operations are possible south of Phu Ly between major points of interdiction.

5. (S/NFD) The rail/highway bridge over the Canal des Rapides, Hanoi's only rail connection to the Dong Dang and Lao Cai lines, which was interdicted at the end of April, was not confirmed to have a rail bypass bridge completed until 30 May. On the other hand, rail service across the Bac Giang Railroad/Highway Bridge farther to the north -- which was attacked at about the same time in April -- was restored the following day. The leisurely pace in restoring rail service over the Canal des Rapides reflects the ability of the North Vietnamese to improvise alternate road and inland waterway transshipment facilities to maintain the flow of traffic.

6. (S/NFD) Large concentrations of locomotives and cars were noted in yards and sidings in the northern and central parts of the country and may have resulted from the interdiction of the rail and road bridge over the Canal des Rapides near Hanoi in late April. In addition, some of

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this equipment may have been idle temporarily because attacks against major industrial facilities have reduced requirements for industrial raw materials and products. Although near record levels of destruction and damage to rolling stock were reported during the period, there is still no evidence of equipment shortages.

7. (S/NFD) New construction designed to increase the capability of the railroad system continues. The detection of dual-gauge track on the Hanoi-Thai Nguyen line at four widely separated locations and the recent completion of two yards in the Hanoi area indicate that standard-gauge equipment may now be able to reach Yen Vien via Thai Nguyen. When completed, the dual-gauging will substantially increase the capacity of the Dong Dang line and eliminate the need to transload goods. The tempo of activity associated with the construction of bypasses for the Doumer Bridge over the Red River increased during the month in probable anticipation of air strikes. A ferry site and pontoon bridge have been completed about a mile downstream, and similar bypasses six miles further downstream are ready to be put in use. In addition, nearly six miles of main streets and roads in and around Haiphong were being repaired and resurfaced with bitumen, perhaps

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to facilitate the use of heavier trucks to expedite the movement of supplies now stockpiled in Haiphong.

8. (S/NFD) The high level of strikes against the highway system continued, with the bulk of the effort in the Panhandle area. Attacks on vehicle traffic increased significantly and pilots reported more trucks destroyed or damaged during May than in any previous month except August 1966. Vehicle sightings were heaviest on roads serving the DMZ and the Lao Panhandle; however, convoys of up to 50 trucks were noted moving along principal routes toward Hanoi from the north. Truck sightings on Buddha's birthday (23 May), during which air attacks were suspended, were not significantly above the average daily number for the month. The period of this standdown (24 hours) limited the time of immunity from air attacks and probably was too short to allow significant exploitation.

9. (S/NFD) Several important motor-vehicle repair shops have also been attacked. These include Kinh No, which represents 10 per cent of North Vietnam's motor vehicle maintenance and repair capacity, and facilities at Cam Pha, Bac Mai, Van Dien, and the Ha Dong Army Barracks. The strikes probably seriously disrupted the centralized motor transport repair shops and may force the North Vietnamese to rely more on dispersed facilities.

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10. (S/NFD) The road network continues to be adequate to meet essential transportation requirements. However, the difficulty and cost of moving a given amount of supplies have been greatly increased. The large civilian labor force has been augmented with troops at critical points, such as on Route 15 near Mu Gia Pass, and construction equipment is increasingly evident. The difficulties in maintaining road trafficability will increase with the gradual onset of the southwest monsoon season (May-September). If normal conditions prevail, sufficient rain will have fallen by July to reduce road capacities in North Vietnam (outside of the southern coastal region) to their annual low.

11. (S/NFD) Waterborne transportation continued at a high level. The majority of air strikes against waterborne traffic were on inland routes below the 20th Parallel. Reported losses of watercraft in May were higher than for any month since the start of the Rolling Thunder program. The North Vietnamese have recently requested delivery of numerous waterway transportation and maintenance craft from the Soviets and other Communist countries.

12. (S/NFD) The five estuaries mined during February and March were reseeded in May to disrupt any Communist efforts to ship large quantities of supplies south during

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the standdown in bombing on Buddha's birthday. The shipping surge never materialized, and the efficacy of these mines remains undemonstrated. Small craft activity in the area continued to be normal, but there are indications that the aerial mining has interrupted the operation of large coastal vessels.

13. (S/NFD) Strikes against coastal transshipment points and naval bases decreased from the previous period. The Hai Yen transshipment point was hit hardest, but no report of damage is available. No strikes were conducted against maritime port facilities during May; however, attacks on supporting installations have affected port operations. Cam Pha reportedly ceased operations from 12 through 16 May due to a lack of electrical power for cargo loading equipment.

14. (S/NFD) Attacks against North Vietnamese airfields continued and prevented flight operations at Kep, Hoa Lac and Kien An for short periods of time following the strikes. The air defense fighter operations apparently shifted to Phuc Yen and Gia Lam during the time the damaged airfields were being repaired. Three to five aircraft were destroyed on the ground at Kep during a 21 May attack, and additional aircraft are believed to have been destroyed during later strikes. Air engagements between 16 May and 13 June resulted

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in the loss of 16 MIG's and an additional two MIG's probably destroyed. Four of the aircraft lost were MIG-21's. During this period only one US aircraft, an F-4C, was lost to enemy aircraft. By the end of the reporting period the North Vietnamese air force reactions appeared to diminish and air engagements decreased, possibly as a result of aircraft losses and air-field interdiction.

15. (S/NFD) Firings of surface-to-air missiles (SAM's) remained high -- 481 were fired from 15 May to 11 June -- but the total declined from the record of the previous reporting period. There were five confirmed and four probable US aircraft lost to missiles. Missile activity in the area of the DMZ decreased as a result of vigorous attacks against occupied SAM sites, and no activity has been noted since early June. It is estimated that the equivalent of one firing SAM battalion was destroyed in the area between Dong Hoi and the DMZ during late May and early June. The North Vietnamese can be expected to make efforts to improve SAM defenses in the Panhandle and DMZ area.

16. (S/NFD) The cumulative effects of the air strikes in North Vietnam have caused multiple management and logistic problems and have degraded North Vietnam's capability for

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sustained large scale conventional military operations against South Vietnam. Hanoi must devote an increasing amount of manpower, material, transportation, and time to accomplish the movement of a given amount of supplies to the South. However, the North Vietnamese still retain the capability to support activities in South Vietnam and Laos at present or increased combat levels and force structures.

Leadership and Public Reactions

17. (S/NFD) During the past month, available information indicates that the residents of North Vietnam's two major cities have experienced further war related dislocations and inconveniences.

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[REDACTED] the capital city is now more than 50 per cent evacuated and Haiphong more than 75 per cent. The remaining population is composed almost entirely of people between the ages of 20 and 40. Food is adequate but shortages of certain items have been reported. For example, in the month of June, residents of Hanoi had to accept 40 per cent of their rice ration in flour -- an increase from a 25 per cent substitution the month before.

18. (S/NFD)

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[REDACTED] the increased

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hardships have not affected popular support for the war effort. The mood of the people continues to be consistently reported as one of resignation under conditions of considerable difficulty.

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Effects on the Economy

19. (S/NFD) The concentrated attacks on North Vietnam's electric power industry are having widespread effects on modern industry. Both the Thai Nguyen Iron and Steel Combine and the Haiphong Cement Plant are inoperative because of bomb damage and loss of power. In addition, it is estimated that the operation of North Vietnam's other modern industrial plants -- chemical, fertilizer, paper, and textile -- is being seriously hampered by the power shortage.

20. (S/NFD) The powerplants at Hanoi, Bac Giang, Uong Bi, Haiphong East, Haiphong West, and the Dong Anh substation were struck during the second half of May; those at Hanoi, Uong Bi, and Thanh Hoa were struck during the first half of June. The total amount of generating capacity out of operation reached a peak in May of 165,000 kilowatts (kw), or 87 per cent of national capacity. The rapid restoration of capacity -- partially offset by restrikes -- reduced this figure to a

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tentative estimate of 150,000 kw out of operation by mid-June, or some 80 per cent of the national total.

21. (S/NFD) Over-all damage to the Hanoi powerplant as a result of strikes on 19 and 21 May probably was moderate.

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[REDACTED] the Hanoi plant was put back into partial operation within five days of the 21 May strike, and it is estimated that some 10,000 kw (of the 32,500 kw installed) of capacity were restored. An adequate assessment of damage resulting from a later attack on 10 June is not yet available. Five underground diesel generating stations in Hanoi are estimated to be supplying around 5,000 kw of power to Hanoi. A combined power supply of 15,000 kw would be equivalent to about 25 to 30 per cent of Hanoi's normal power requirements.

22. (S/NFD) By the end of May, five of North Vietnam's damaged powerplants -- Uong Bi, Ban Thach, Ben Thuy, Nam Dinh, and Thanh Hoa -- had been restored to partial operation or were almost ready for partial operation. The most extensive reconstruction was at Uong Bi, reflecting the importance of this plant to the Hanoi-Haiphong power network. Photography indicates that 24,000 kw probably had been put back into service before the 11 June strike (which probably rendered the plant inoperable).

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23. (S/NFD) The Thai Nguyen Iron and Steel Combine, one of the most significant of North Vietnam's industrial facilities, was struck during the reporting period. Aerial photography taken through 24 May indicates that only one of the three blast furnaces remained undamaged. Additional damage had been inflicted on the conveyor systems, steam facilities, and other auxiliary facilities necessary for the production of pig iron, and it is highly unlikely that pig iron is being produced. Pig iron production may be discontinued for an extended period if the two transformers at the on-site substation of the plant have been removed, as photography suggests. This substation, the main source of electricity for the steel plant, was fed by the heavily damaged Thai Nguyen powerplant several miles away. The status of barge, POL tank, and pontoon fabrication at Thai Nguyen is unknown at this time. Through the use of portable generators, some fabrication could continue in undamaged portions of the complex.

24. (S/NFD) Identified seaborne imports reached a record high total of 147,400 metric tons during May, some 5,300 metric tons greater than the previous record volume observed in March of this year and nearly twice the average monthly volume of 77,100 metric tons observed in 1966. Imports of

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foodstuffs (69,400 metric tons) and petroleum (35,700 metric tons*) reached record volumes. The level of foodstuffs imported during May represents about a ten-fold increase over the average monthly volume for 1966. Heavy imports of food during the first five months of 1967, equivalent to about five per cent of the annual rice production, should be sufficient to overcome any shortages until harvesting of the spring rice crop is completed. Although the port of Haiphong has substantially increased its offloading performance, the higher level of seaborne imports has resulted in a backlog of freighters that appears to be the worst yet experienced. Dry cargo ships were in Haiphong an average of 17 days during the reporting period, compared with an average time in port of about 13 days during 1966. Tankers continue to be offloaded promptly, however.

25. (S/NFD) Foreign exchange earnings from seaborne exports of coal, apatite, cement, and pig iron were the lowest recorded. More than 50 per cent of the decrease during May is attributable to reduced coal shipments from Cam Pha and Hon Gai. There continued to be no seaborne exports of apatite. Exports of cement ceased after damage to the Haiphong Cement Plant and its loss of electric power in late April, and the North Vietnamese have reportedly cancelled contracts calling for the export of cement.

* See footnote to paragraph 26.

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26. (S/NFD) Identified imports of petroleum amounted to about 35,700 metric tons,* the highest monthly total observed to date. Average monthly imports for the first five months of 1967 were about 25,700 metric tons, considerably greater than the monthly average of 16,700 metric tons observed during 1966. The consumption of petroleum during May is estimated to have increased to at least 18,500 metric tons, because of increased transportation demands and the greater use of diesel powered generating units. Stocks on hand as of 31 May are estimated to have amounted to at least 64,000 metric tons, equivalent to about 100 days of supply.

27. (S/NFD) North Vietnam continues to negotiate with other Communist countries for additional aid projects. During the current reporting period, the Soviet Union sent 30 specialists to the Vang Danh coal mine. Hungary agreed to construct a \$2 million hand tool and balance factory and promised delivery within two years. Poland has sent a group

* This figure includes 7,000 metric tons believed to have arrived on 27 May from China on a British flag tanker under charter to the Chinese Communists. While information on the actual cargo is not yet available, on a previous trip in January the tanker is known to have transported petroleum from China to Haiphong.

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of coal washing specialists to Hanoi who presumably are destined for the Cam Pha Coal Washing Plant. France reportedly sold a textile mill to North Vietnam in January with a capacity of 20,000 spindles, about two-thirds the size of the spinning section of the "8 March" Textile Plant in Hanoi.

28. (S/NFD) Cumulative measurable damage attributable to the Rolling Thunder program through May is estimated to be \$266 million.* (See Tab B.) Of this total, \$33 million was the result of air strikes during May. In addition to the measurable losses, there continue to be many other losses to the economy and to the military establishment which cannot be assigned meaningful values.

* A re-evaluation of damage to SAM sites reveals that the estimate of damage inflicted during 1965-66, based primarily on pilot reports, was too high. The value of aircraft and naval craft destroyed prior to April 1967 also has been revised. Previous assessments of the value of these items were calculated on the basis of US production costs for comparable equipment. The assessment in this report is made on the basis of Soviet foreign trade prices (prices charged for similar equipment sold to less developed countries) as those most closely approximating the true value of this equipment. If estimates had been continued on the same basis as used prior to April cumulative damage to military targets through May would have totaled \$123 million and increased the cumulative costs of measurable damage to North Vietnam's economy and military facilities to \$306 million.

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RESULTS OF STRIKES ON NVN TARGETS a/ THRU 10 JUNE 67 TABLE 360

Fixed Targets	Total Targets <u>c/</u>		Targets Struck		<u>e/</u> No. of Attacks	<u>b/</u> Strike Sorties	% Of National Capacity Destroyed or inactive because of air strikes	
	National Capacity (X 1000)	JCS <u>d/</u> Targeted	<u>d/</u>					
			No.	%				
Barracks	443 men	65	41.08	54	32.3	352	2902	25.44
Ammo Depots	112.6 MT	18	100	18	100	75	1328	76.5
POL Storage *	133.5 MT	13	100	13	100	85	696	86.6
Supply Depots	10550 SqFt	29	42.48	23	44.4	66	745	17.84
Power Plants	187 KW	20	94.5	14	76.1	66	536	80
Maritime Ports	7.8 ST/Dy	8	95	6	44	27	235	12.1
RR Yards	33.7 ST/Dy	4	78	3	54	63	393	23
RR Shops		3	88	2	68	4	33	21.6
Industrial:								
Explosive Plt	1 MT	1	100	1	100	3	28	100
Iron & Steel	300MT(PIG)	1	100	1	100	21	241	100
Cement Plant	600 MT	1	100	1	100	1	57	90
Airfields	23	11		6	36	24	532	23
Naval Bases	15	5		3	42	25	231	19.5
Bridges	1,529	61		52		406	3266	55.8(of those tgtd)
Commo Install	45	5		2		2	15	20
Radar Sites	160	5		5		74	434	37.5
SAM Sites	134			58		112	388	
Locks & Dams	43	8		2	10.6	2	10	5.3
Ferries	34			11		7	44	

* JCS targets only; does not include dispersed storage.

Total Sorties: 12,352		<u>Results f/</u>	
<u>Armed Recce Sorties</u>		<u>Destroyed</u>	<u>Damaged</u>
130,795		6,728	12,383
Vessels		3,582	3,598
Vehicles		1,029	1,933
RR Stock			

a/ Assessments are based on best information received, will be refined as more accurate information becomes available.

b/ Strike plus flak suppression sorties. Some applied to multiple targets; in this summary assigned to principal target.

c/ These columns are not additive, since the number of installations, both targeted and struck in some cases, apply to more than one category of targets (i.e., barracks, supply and ammo depots).

d/ Percentages of national capacity where appropriate.

e/ Also numerous attacks during armed recce and other missions.

f/ Also numerous installations, AA sites, bridges, etc., attacked and road and rail cuts made.

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Value of Economic and Military Damage
Attributed to the ROLLING THUNDER Program
1965 Through May 1967

<u>Economic</u>		<u>Military</u>	
<u>Direct Losses</u>	<u>Million US\$</u>	<u>Direct Losses</u>	<u>Million US\$</u>
Railroad/Highway Bridges	25.4 <u>a/</u> <u>b/</u>	Barracks	23.1 <u>a/</u>
Transportation Equipment	47.1	Ammunition Depots	5.2 <u>a/</u>
Electric Power Plants	23.4	Supply Depots	5.6
Petroleum	7.4	Airfields	0.6
Manufacturing Facilities	15.9	Radar and Communications	
Railroad Yards	5.2 <u>a/</u>	Sites	2.8
Maritime Ports	1.4 <u>a/</u>	SAM Sites	3.9 <u>a/</u> <u>c/</u>
Miscellaneous Armed		Naval Bases	1.6 <u>a/</u>
Reconnaissance	1.5	Aircraft	28.4 <u>d/</u>
		Naval Craft	3.8 <u>d/</u>
SUBTOTAL, Direct Losses	127.2	Miscellaneous Armed	
		Reconnaissance	7.6
<u>Indirect Losses</u>		TOTAL, Direct Losses	82.6
Exports	21.9		
Agriculture <u>e/</u>	25.5		
Fishing	8.3		
SUBTOTAL, Indirect Losses	55.7		
TOTAL, Direct and Indirect	182.9		
		<u>TOTAL</u>	
		<u>Million US\$</u>	
		Economic	183
		Military	83 <u>f/</u>
		TOTAL	266 <u>g/</u>

a/ Estimate is incomplete because of inadequate post-strike photography.

b/ Of the total, \$4.5 million is estimated to have been expended to date on the repair of damaged and destroyed bridges and \$20.9 million is estimated for complete restoration in the future of bridges damaged or destroyed. In addition, \$1.2 million would be required to make temporary repairs to presently unrepaid bridges.

c/ Recent extensive analysis reveals that previous estimates of damage inflicted during 1965-66 were too high.

d/ Previous assessments of the value of aircraft and naval craft destroyed by air attack were calculated on the basis of US production costs for comparable equipment. The assessment in this report is made on the basis of Soviet foreign trade prices (prices charged for similar equipment sold to less developed countries) as those most closely approximating the true value of this equipment.

e/ It should be noted that losses of agricultural crops are arbitrarily attributed entirely to the indirect effects of the bombing. An unknown part of these losses is in fact due to weather and other natural causes.

f/ If estimates had been continued on the same basis as previously used, see footnotes c and d, cumulative damage through May would have totaled \$123 million.

g/ Excluding the cost of trucks destroyed and damaged in Laos and economic and military facilities and equipment destroyed and damaged by US naval operations along the coast of southern North Vietnam.

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G-2	1 Cy

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CINCPACAF	1 Cy
CINCUSARPAC	1 Cy
CINCPACFLT	1 Cy
COMUSMACV	2 Cys
7AF	2 Cys
COMSEVENTHFLT	1 Cy
COMATKCARSTRIKEFORSEVENTHFLT (CTF 77)	1 Cy
CINCLANT	1 Cy
CINCSRIKE	1 Cy
CINCSAC	1 Cy
SAC 544	1 Cy
CINCTAC	1 Cy
AFSTRIKE	1 Cy
COMTIC	1 Cy
CINCALCOM	1 Cy
CINCEUR	1 Cy
CINCUSAREUR	1 Cy
CINCUSAFE	1 Cy
CINCNAVEUR	1 Cy
CINCCONAD	1 Cy
CIA	125 Cys

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DIASC-1	1 Cy
JS	1 Cy
CO-2C	1 Cy
AP	1 Cy
AP-2	1 Cy
AP-2C2	2 Cys
AP-2D1	1 Cy
AP-2D2	1 Cy
AP-3	1 Cy
AP-4	1 Cy
AP-4A	1 Cy
AP-4A2 (Pent)	6 Cys
AP-4A2 (AHS)	4 Cys
AP-4B4	2 Cys
AP-4C	3 Cys
AP-7	2 Cys
AP-8	2 Cys
XX	1 Cy
JT	1 Cy

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